

Poisonous Snakes of India

Those marked with an * are most deadly.

Those marked with a † are most common among the most deadly.

POISONOUS COLUBRINE SNAKES

Elapide

- | | |
|----------------|---|
| 1. Naja | N. tripudians †, cobra, several varieties |
| 2. Ophiophagus | O. elaps*, hamadryas |
| 3. Bungarus | B. cæruleus †, krait |
| 4. " " | B. fasciatus, sankni |
| 4. Xenurelaps | X. bungaroides |
| 5. Callophis | C. intestinalis and several other species |

Hydrophida, or Sea Snakes (all deadly)

- | | |
|--------------|---|
| 1. Platurus | P. scutatus, P. Fischeri |
| 2. Hydrophis | H. cyanocincta, and several other species |
| 3. Enhydrina | E. bengalensis |
| 4. Pelamis | P. bicolor |

VIPERINE SNAKES

Crotalida, or Pit Vipers

- | | |
|-----------------|--|
| 1. Trimeresurus | T. gramineus and several other species |
| 2. Peltopelot | P. macrolepis |
| 3. Halys | H. himalayanus |
| 4. Hypnale | H. nepa |

Viperida, or true Vipers

- | | |
|-----------|--|
| 1. Dabeia | D. russellii †, Chain Viper, Tic-polonga |
| 2. Echi | E. carinata †, Phoorsa snake, Afae, Kuppur |

The following is a scale of the rewards offered in different parts of India, at different times, for wild beasts and snakes :—

TIGERS

	Rupees.
Bengal	12½ to 50
Berar	10 „ 20
Bombay	6 „ 60
Burmah	5 „ 20
Central Provinces	10 „ 100
Hyderabad	20
Madras	50 to 500
Mysore	35
North-West Provinces	10
Oudh	None
Punjab	None
Rajpootana	10 to 15

LIONS

The only record of which I find official mention, is 25 rupees in Kotah.

PANTHERS, LEOPARDS, CHEETAHS

	Rupees.
Bengal	2½ to 10
Bombay	3 „ 12
Burmah	5 „ 10
Hyderabad	10
Madras	25
Mysore	15
North-West Provinces	5
Rajpootana	8 to 10
Central Provi: ces	5 „ 12

WOLVES

	Rupees
Bengal	5 to 20
Berar	3 „ 5
Bombay	4
Central Provinces	2 to 5
Madras	5
North-West Provinces	5
Oudh	1 to 6
Rajpootana	5

HYÆNAS

	Rupees.
Bengal	1 to 2
Berar	5
Central Provinces	½ to 2
Madras	3½

BEARS

	Rupees.
Bengal	1½ to 2½
Berar	5
Bombay	3 to 12
Burmah	5 „ 12
Hyderabad	5
Madras	5
Central Provinces	2 to 5
North-West Provinces	3
Rajpootana	5

SNAKES (Species not reported)

Bengal	4 annas
Berar	—
Bombay	6 pie to 4 annas
Burmah	—
Central Provinces	1 rupee
Hyderabad	8 annas to 2 rupees
Madras	1 anna
Mysore	8 annas
North-West Provinces	2 rupees
Oudh	—
Punjab	2 annas
Rajpootana	1 to 8 annas

No rewards appear officially proclaimed for elephants, buffaloes, or bisons. In cases of notorious rogue elephants rewards have been specially given. In Burmah 5 to 20 rupees offered for alligators; in special cases, more has been given in Bengal and Madras.

The difference in the amount of the rewards appears to indicate that higher sums were offered in special cases, probably when the creature was a notorious man or cattle-slayer.

Now I cannot help thinking that if Government made it part of the duty of district officers, not only to proclaim these rewards but to encourage the destruction of wild animals and snakes, by means of an organised establishment, which should be supplied in these districts, much benefit might result. The money rewards already offered would probably suffice for wild animals, but those for venomous snakes should be increased; if, at the same time, the people were encouraged to work for the rewards, and were aided by persons acting under properly selected superiors, the result would soon show a diminution of the wild animals and snakes. But, I repeat that not until some organised establishment is formed, to be worked steadily throughout the whole country—not dependent on the will or subject to the caprice of individuals, but under local officers subject to one head—will any real or progressive amelioration of the evil be effected. Such a department under a selected officer, would, as was the case with the Thugs and Dacoits, soon make an impression on a death-rate which, so long as it continues in its present condition, must be referred to a defect in our administration.

J. FAYRER

PALÆOLITHIC IMPLEMENTS OF NORTH-EAST LONDON

IN 1855 Prof. Prestwich published in the *Quarterly Journal of the Geological Society* an account of a fossiliferous deposit in the gravel of West Hackney. The precise locality of the excavation is given, and from 1855 to now many neighbouring excavations have been made. They almost invariably exhibit the "Palæolithic Floor." In 1855 only little was known of palæolithic implements, yet it is a remarkable thing that none of these objects, so common and well-made as they usually

are at West Hackney, arrested Prof. Prestwich's attention. It is also remarkable that although a list of twenty-three land and freshwater shells is given in that paper, yet it does not include the only two of especial interest, viz. *Corbicula fluminalis*, Müll., and *Hydrobia marginata*, Mich.; the first of which is extremely common, and the latter frequent. The branches of trees, "sharply broken into short pieces," and the fossil bones, "showing no trace of wear or fracture," are frequent in all the West Hackney pits. One may be sometimes very near a curious discovery and yet miss it.

In NATURE, vol. xxvi. p. 579, I described and illustrated the West Hackney, or Stoke Newington, palæolithic gravels as understood by me, confining myself to the geological aspects of the situation. I now approach the subject of the weapons and tools contained in the drift of that place. Of the stone implements there are three distinct varieties, each belonging to a different geological time. The implements of these ages are not confined to the valley of the Thames, as they are marked with almost equal distinctness in other places as at Canterbury, Bedford, Southampton, and elsewhere.

In looking for the oldest human works, it would be unreasonable to expect symmetrical implements. The very earliest weapons and tools used by our most remote precursors must have been natural or accidentally broken stones:—naturally pointed stones and stones with a naturally suitable cutting or chopping edge; the first attempts at implement making must have been at the time when the primæval savages "quartered" a stone by smashing it, and then selected pointed and knife-like pieces of this stone for tools.

None of the following rules are without exceptions, for amongst the implements which are usually very large, a very small specimen may now and then occur; and amongst those which are usually very small, there may be at times a large example. The lustre and deep ochreous tints may at times vary a little. Notwithstanding exceptions, when all the characters are taken together, the distinctness of the three classes will hold good.

The oldest known tools are the rarest, and, according to my estimate, can be recognized by the following characters:—they are generally lingulate, or club-shaped, with a heavy butt, often rudely ovate, never acuminate, generally large and very rude, frequently with a thick, ochreous crust, and always greatly abraded, as if they had been tossed about for ages in the sea. Some of these implements are so much abraded that they have lost almost every trace of flaking. These old implements acquired their ochreous crust before they were buried in the gravel, as they occur amongst sub-angular lustrous flints and even chert gravel, where only the implements and a few stray stones exhibit the ochreous crust. I have seen no trimmed flakes or scraping tools belonging to this older age. In London, these old implements are generally found near the bottom of the twenty feet (or even thirty feet) excavations. At Canterbury they occur in thin seams of distinct ochreous material where all the contained flints have an ochreous surface. All these older tools were made at a long distance from where they are now found. Two Canterbury examples are illustrated, half actual size at Fig. 1 and 2, Nos. 100 and 126 in my collection. A very important point has now to be especially noticed: when these ochreous instruments were originally tossed about and buried in the gravel some of them became chipped and even broken. Now, the chipped and broken surfaces of these older implements, as at A A, Fig. 1, are *never ochreous*, but invariably of the natural colour of the flint and lustrous. This lustre has been acquired since the gravels were laid down, and it exactly agrees with the lustre of the sub-abraded lustrous implements of medium age found from 8 feet to 10 feet above the ochreous ones. It follows, therefore, that the lustrous implements, although enormously old, can only be as old

as the time when the ochreous ones were bruised and broken in the gravels where they are now found.

Another fact must be mentioned here: the men who used the oldest known tools sometimes broke them in two whilst they were at work with them; the accidentally fractured surfaces of this class are of course as old as the tools, and therefore always ochreous. Points and butt ends wholly ochreous are of common occurrence: these pieces of tools must have been shattered for long ages before the gravels of middle age were laid down.

The men who made and used the rude ochreous tools were to a great extent a "whole handed" race—they had not learned the full use of their fingers but held the weapons as one would now hold a heavy stone for smashing. It is probable that the more pointed end of the club-shaped implements was sometimes grasped in the hand and the butt used as a club or hammer. The absence of scrapers indicates that the men probably knew nothing of dressing skins, and were unclothed.

In and near London lustrous and sub-abraded tools of medium age are commonly found at a depth of 12 feet; these tools show a distinct improvement in workmanship over the older ones. Most of the examples are lingulate and acuminate, and the butt, and sometimes the unbo, shows signs of hammering, the ovate form is not uncommon, but the cutting edge all round I have not yet seen. A few chisel ended implements occur. Rude choppers and somewhat large scraping tools are common. All the artificially chipped stones of this medium age are sub-abraded and lustrous. They were not made where now found, but have been carried by the drift for a short distance. A pointed weapon and chopper of medium palæolithic age are illustrated half real size at Figs. 3 and 4, Nos. 588 and 482 in my collection. A scraper of the same age is illustrated at Fig. 5, Scraper No. 9 in my collection.

When the lustrous sub-abraded tools were made the men had by that time acquired the habit of holding their weapons in a lighter fashion,—still in the palm, but more lightly held with the thumb and two next fingers. The frequent presence of horse-shoe and side scrapers now indicates that the men had possibly learned to rudely dress skins for clothing. Sometimes unfinished implements are found; one of medium age from Lower Clapton, London, is illustrated at Fig. 6. The dotted line shows where the point would have been, if the maker had finished it. Implements roughly blocked out to form, and without any secondary trimming, are common: it would appear that the men sometimes first blocked out a number of implements rudely with a heavy hammer-stone, and afterwards finished with neater fabricating tools. An implement in a preparatory stage, of which I have many similar examples, is illustrated in Fig. 7, from Bedford. Many implements were accidentally shattered in the course of manufacture, and the shattered failures are common in all implementiferous gravels.

Long after these two classes of tools were buried by floods of water deep in the gravel and sand, there lived a third race of palæolithic men, as far removed from the men who made the lustrous sub-abraded implements as these latter men were from the makers of the ochreous and highly abraded instruments. These newer tools are found at Stoke Newington at about 8 feet above the lustrous examples, and generally about 4 feet from the present surface. In some places so much top material has been taken off for brickmaking that the stratum containing the newer implements is almost exposed on the surface. Denudation since palæolithic times has considerably altered the contours round north London, and the "Palæolithic Floor" at South Hornsey, close to Stoke Newington, is 14 feet below the surface instead of 4 feet—this 10 feet has been removed in some places by the rains of centuries, in others by modern brickmakers and nurserymen.

The newest palæolithic implements are as a rule not highly lustrous as in the last, but sub-lustrous, and often even dull; not abraded or sub-abraded, but as sharp as on the day they were made. As a rule they are very much smaller and lighter than anything belonging to the two previous periods. An example is illustrated half real size at Fig. 8, No. 403, in my collection. Other characteristic specimens are illustrated at Figs. 9 and 10. Fig. 9

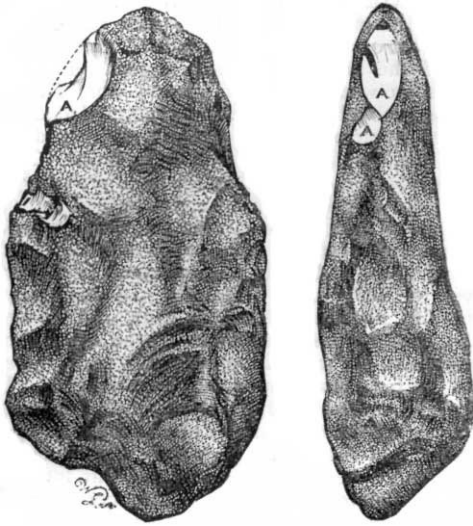


FIG. 1.

is a thin and exquisitely manipulated trimmed-flake, No. 47 in my collection, weighing only $1\frac{3}{8}$ ounces. Fig. 10 is an implement worked on both sides, the natural crust of the flint being left untouched on the butt, weight only $1\frac{1}{8}$ ounces, No. 627 in my collection. Oval implements with a cutting edge all round now appear; a few examples, as in the last period, occur where the broad end (as in neolithic celts) appears to have been designed for cutting or chiselling; scrapers are common, not large

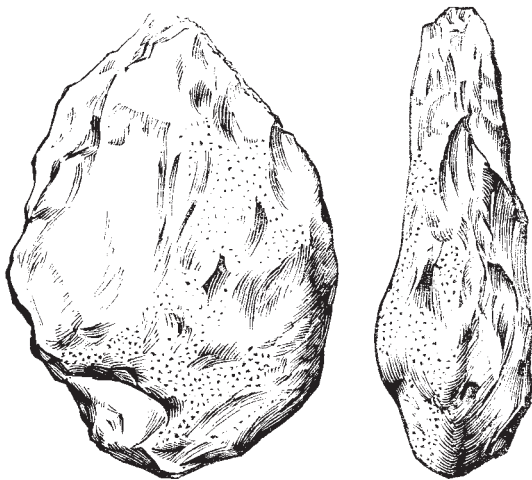


FIG. 2.

and rough, but as a rule small and extremely neat. One is illustrated at Fig. 11, half actual size, scraper No. 22 in my collection; small knives, *i.e.* flakes, with the edge or edges showing very neat secondary trimming, are common, and hardly to be distinguished from neolithic "knives." As a rule every object is now neat, small and fine.

That these later implements are of a different age from

the last is proved by the curious fact that the newer implements are sometimes re-made from older ones, *i.e.* re-trimmed after the lapse of a vast period of time. I have several such examples, one a scraper belonging to the "Palæolithic Floor": it is made from an old lustrous flake of medium age, all the more recent work being dull and sharp. At Fig. 12 is illustrated, half real size (No. 452 in my collection), an implement of later palæolithic age from Bedford. It is an old implement that was "found" after a lapse of time by a newer palæolithic man and re-pointed. The finder had probably sense enough to know that the thing he found was really a human-made implement, only wanting a little fresh work to make it "as good as new." This man stands in contrast with the very few individuals (still extant) who say they can see no evidence of design in drift tools. The original form of the implement is indicated by the dotted lines, C, C, C; the natural crust of the flint is present at the base on both sides, shown by dots in the illustration. The original mid-age flaking is shown at B, B, B, and

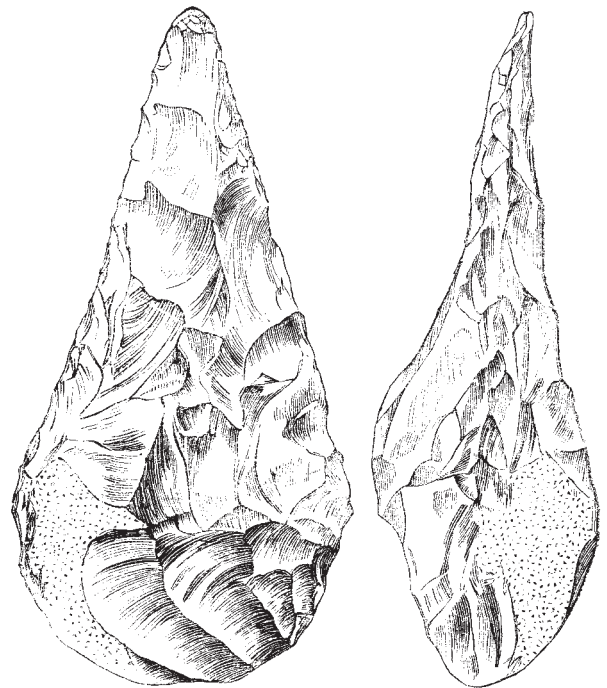


FIG. 3.

the work of the newer palæolithic man is exhibited at D, D, D. The old finder of the implement gave two new edges and a new point to the tool, and improved the shape of the butt; the newer work is creamy white and lustrous, and in distinct contrast with the older work. When this implement was thrown out of the pit by the workman, the newer point got accidentally injured, at E, F. This injury, by exposing the interior of the flint, shows that the tool was originally a greyish-black one, and that since it was last pointed, it has acquired a thick, white bark by the decomposition of the flint. Now, neolithic flints at Bedford (where the example under examination was found) remain blackish-grey to the present day; the thousands of years (say from two to ten) since they were chipped have been insufficient to cause even the thinnest conceivable while film of decomposition to appear, but this palæolithic example has acquired a white bark of a sixteenth of an inch in thickness. How much older then must this *new point* be than the neolithic flints from the same place. The new point being inconceivably old, how much older must the old butt be! The implement, how-

ever, that was "found" (as proved by the flaking of medium age) was new as compared with the older, highly-abraded examples. There is other evidence of the extreme antiquity of these things. They are *all* beneath the "trail and warp." Now the "trail" belongs to geological time, and the period of its deposition is so remote that one can only guess at its age in years. The newest palæolithic implements are every one beneath and older than the "trail," how very much older, then, must be the oldest implements. The proofs that they are really older I have given.

The tools of the later palæolithic period show a marked development of the hand in the makers, for the chippers of these later tools had learned to hold small instruments with the fingers, much as we now hold a small pen, pencil or knife. From the rude and heavy bludgeon the men had advanced to beautiful oval and ovate forms almost perfect in geometrical precision. The progress from the large and rude, to the extremely small and neat scraper, shows that the men had probably progressed in the art of dressing skins, and in every way did finer and neater things. That these men and women now wore necklaces, and possibly bracelets, seems proved by the fact of specimens of *Coscinopora globularis*, D'Orb., occurring with the natural

living places stretched in unbroken lines on the old river banks. The "Palæolithic Floors" are not little isolated patches, but places extending for many miles, how large they are it is impossible to say from paucity of excavations.



FIG. 5.

They are not confined to the valley of the Thames, but they occur in many places.

The newer implements and those of middle age are innate with, and have belonged to the gravel from the first. The older implements are distinctly "derived" like the cretaceous fossils commonly found in the gravel. We know whence the fossils have come because they are so common, the abraded ochreous implements on the other hand are very rare, and this rarity makes it difficult to say whence they have been derived, they possibly belong to none of our existing rivers. As in 1868 (*Journal of Anthropological*



FIG. 4.

orifice, artificially enlarged. I have several specimens thus enlarged from a horde of more than two hundred, examples all found together near Bedford. Mr. James Wyatt, F.G.S., noticed a similar fact, as recorded by him in the *Geologist* 1862, p. 234. These later palæolithic men lived in large and probably peaceful companies, and their



FIG. 6.

Institute, Feb. 1879), I recorded my discovery of flakes and implements in the so-called middle-glacial gravel of Amwell, Ware, and Hertford, I have little doubt that the older implements found at North-East London have been derived from these positions. Whether the above-mentioned gravels are really glacial or not, I am not prepared to decide. How the implements got into the gravel I cannot say. I found them in the ballast thrown out of the pits and in the pits themselves. If the gravel is glacial could not glaciers have swept up flakes and tools from old surfaces in the same way as the "trail" has undoubtedly done?

Great caution must be exercised in the acceptance of implements as of glacial age, even if found on the surface of glacial gravels. Men of the later palæolithic age lived only seven miles south of Ware, and there is no reason why they should not have strayed over those high

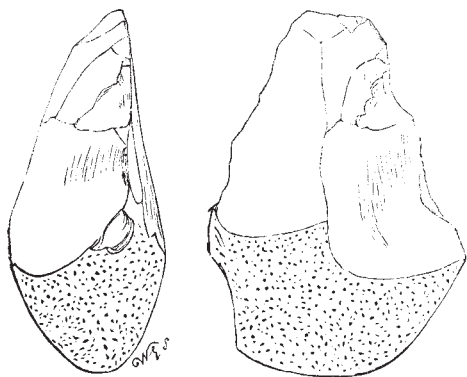


FIG. 7.

positions. Some of the later tools have glacial striæ on the original crust.

There is apparently, but perhaps not really, a gap between each of these three palæolithic periods, as there is apparently a gap between palæolithic (in its vague general sense)



FIG. 8.



FIG. 9.



and neolithic times. Each older period however, has forms which foreshadow the forms which follow in succeeding periods even down to neolithic times. No doubt the fossil bones, if a good series could be obtained, would show a succession of, or possibly different groups, of animals

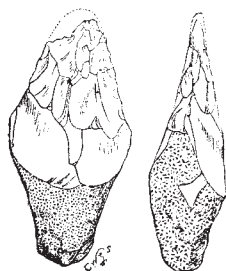


FIG. 10.



FIG. 11.

in the different deposits, but the bones, antlers, and teeth met with by me, are at present insufficient to define any such groups with distinctness.

The day will come when we shall know much more of palæolithic men than we know now. At present we only know that such men once existed and made

weapons and tools of stone during long periods of time. How or where they first appeared as human creatures we can only guess. When we know more we shall modify our use of such terms as "River Drift Men," "Cave Men," &c., and we shall probably be able to mark out more or less distinctly a succession of men, a succession of geological events, and a distinct succession of progressive steps in the men from the lowest savage to the barbarian. Some of our ignorance is undoubtedly caused by the undue attention that has been bestowed on the collection of ornate implements and to the employment of gravel-diggers for their collection. No greater mistake can be made than the mere getting together of the more highly-finished and perfect implements. We only learn from them that certain makers, at first few and far between, common at last,—acquired extraordinary skill in the manufacture of stone tools and weapons. For one perfect example, twenty have their points, butts, or edges injured either by peaceful or warlike work. Collectors

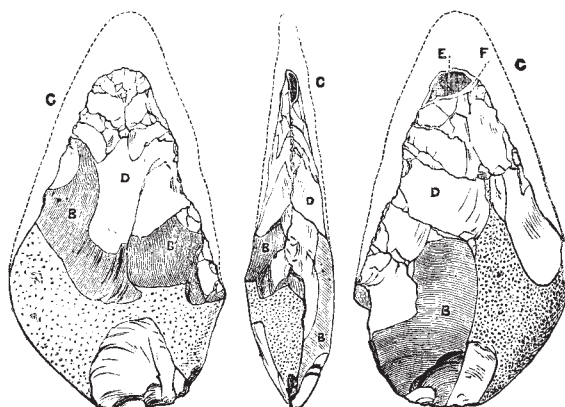


FIG. 12.

will not put the damaged examples and failures in their "cabinets;" but every damage tells some story of the use of the implement, and throws some light on the character of the being who made and used it.

Implements could not have been made without fabricating tools—without punches, hammer-stones, and anvils;—where the ordinary implements are, these latter things also are. Implements such as are seen in museums are only fit for moderately rough work; very rough work was sometimes done, but rough and massive stones artificially worked are seldom seen in collections.

Knives, scrapers, wedges, heavy choppers, punches, anvils, cores, abraded hammer-stones, and other things have all been recovered by me from Stoke Newington, London; but as this paper has already exceeded the limits set apart for similar articles, the description and illustration of these less-known objects had better be deferred.

WORTHINGTON G. SMITH

LEVER'S ARC LAMP

SO many rival forms of lamps have recently been devised for regulating the electric arc light that even specialists in this branch of applied science have some difficulty in keeping up a knowledge of all the various systems. Amongst those, however, there is a tolerably well-defined class of lamps in which the movements of the carbon-holder are regulated by a clutch or kindred device, which grips the holder and raises it, lowers it, or releases it when required. Clutch lamps date back, indeed, to the year 1858, when a lamp of this type invented by Hart, the instrument maker, received a prize from the Royal Scottish Society of Arts. Amongst the more modern forms of clutch lamp those which have hitherto